THE CARE AND CLEANING OF MODERN FIREARMS

By

Major Townsend Whelen

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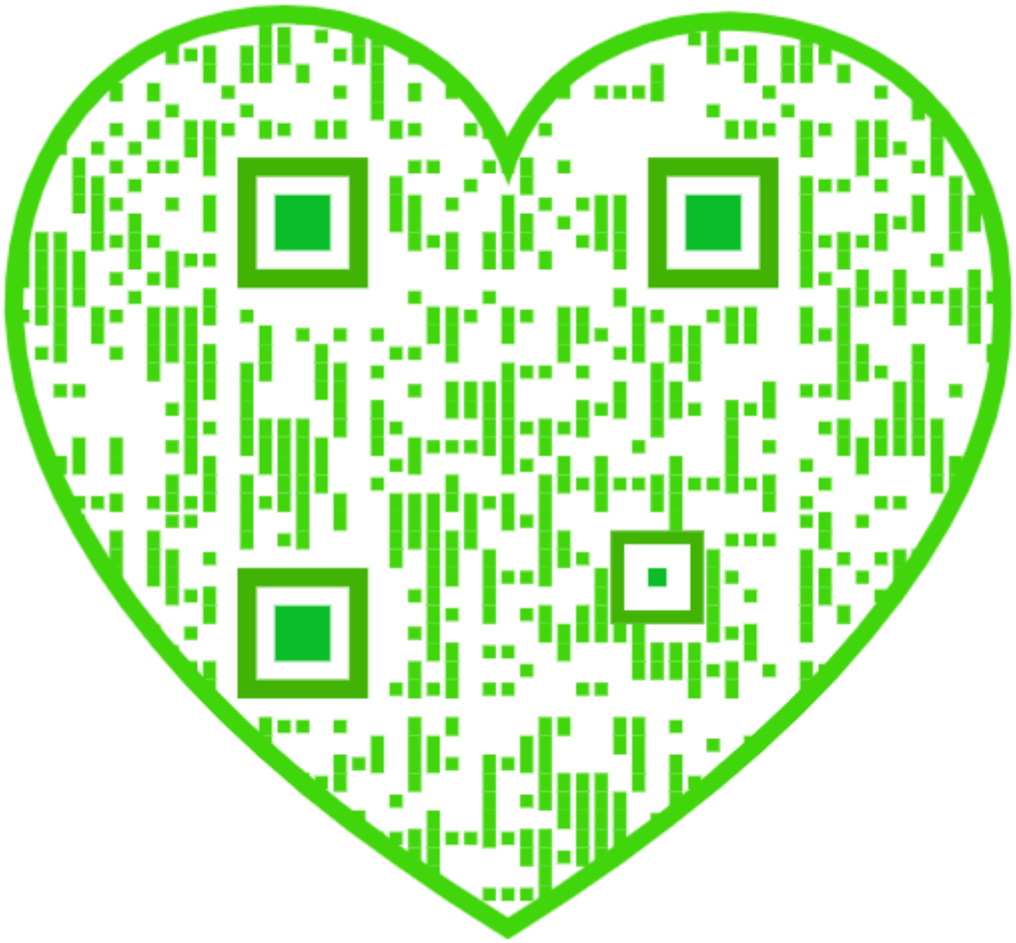

Good guns—good care—good sport!

THE CARE AND CLEANING *of* MODERN FIREARMS

A complete treatise on the proper cleaning and preservation of all types of rifles, revolvers, automatic pistols, and shotguns, showing the proper methods by which their good shooting qualities may be indefinitely preserved.

By

Major Townsend Whelen

With illustrations from original photographs and drawings

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INTRODUCTION

This handbook is a comprehensive, authentic, and practical treatise on the cleaning and preservation of modern firearms. The very latest thought on the subject is here presented, and the matter has had the earnest attention of our best chemists, as well as practical and experienced riflemen and sportsmen.

This handbook is also an advertisement telling of the many merits of the preparations of the CONVERSION PRODUCTS CORPORATION. The author believes in these preparations, and knows of nothing better. Irrespective of whether or not the reader is a user of these preparations, he cannot fail to derive a vast amount of information and benefit from the data contained in the following pages.

The distinctive need for a work on this subject is shown by the fact that firearm manufacturers and authorities receive more inquiries on how to clean and care for firearms than on any other one subject. By applying the principles contained herein the shooter may rest assured that his weapon will always be in condition to do its part.

I

The Necessity for Care

A firearm is a piece of fine machinery. Like any other machine, if it be treated with the proper care at the proper time it will last a lifetime and always give satisfaction. Fail to give it this care, and it will soon deteriorate.

But the care of firearms is often more important than the care of any other kind of machinery. For example, the soldier's life may depend upon the efficiency of his rifle or pistol. Many of our pioneers depend on their weapons for their subsistence. A sportsman may have a complete failure on a long and expensive trip that he has planned for years due to negligence in the care of his weapon.

In some respects the care of a firearm is more complicated and difficult than the care of other machinery. It is often exposed outdoors to very severe weather. The firing of the cartridge introduces into the bore a fouling which will most certainly cause rust and deterioration unless it is quickly and completely removed.

Many novices fail to appreciate the necessity for the proper care at the proper time. We have often seen a man pull a fine gun from its case where it had lain for a long time to exhibit it to a friend, or perhaps to take afield, and on examining it find it to be covered with rust within as well as without. Most often he will say that the gun needs cleaning. Rather would we say that the gun was ruined. Too few men appreciate the real meaning of RUST. Rust always means deterioration. It always means that some of the metal, the steel, has been eaten away. This steel that has been eaten away can never be restored. There has been decided deterioration, depending on how deeply the rust has eaten the metal away. It is true that the rust can be removed so that the weapon will look better, but what we want in a firearm is not so much looks as shooting and functioning efficiency. These qualities deteriorate appreciably even with very slight rusting, or temporarily from dirt. It is not possible to restore the good shooting qualities of a barrel that has been allowed to become even slightly rusted. Once the germ of rust has started it is very increasingly difficult to prevent it in the future.

It is not only necessary that the weapon be cared for at the proper time, but that it be *properly* cared for. We have seen a sportsman run a rag, or even a greasy rag, through the bore of a gun, wipe it off outside, and place it away with the thought that he had done all that was necessary. And then when he next examines the weapon he finds that it is practically ruined, and the chances are that he blames the makers of the gun, or the makers of the ammunition, for did he not clean it before he placed it away?

In the days of black powder and lead bullets the cleaning of firearms was quite a simple matter. Very often the running of a couple of greasy rags through the bore was all that was necessary. But with the introduction of modern smokeless powders with their acids and their high

temperatures, cleaning became more complicated, and has now really evolved itself into a chemical treatment. If we render steel chemically clean, and then protect it from the effects of damp atmosphere with a surely adhesive coating of a thick neutral grease similar to STAZON it will maintain its perfect condition indefinitely. It remains then merely necessary to evolve a practical method by which the sportsman, soldier, hunter, or trapper, can render the steel surface of his weapon practically chemically clean and dry. It is easy for the chemist to render a steel surface clean with the many facilities available in his laboratory, but with the sportsman or other shooter it is a different matter. Perhaps at the end of a day's sport he is in camp, it is raining, and he is tired. No long and tedious or complicated operation will be tolerated at such a time. The cleaning and care must be easy and quick, readily applied, and no bulky, extensive, or expensive equipment should be necessary. It remains therefore to evolve a practical method of cleaning and care for the shooter; one which he can and will apply, and can readily understand. The methods outlined herein present to the user the best known practices of the day—he has merely to take his choice.

II
Fouling

The most important part of any firearm to keep clean is the bore, because the accurate and satisfactory shooting of the weapon depends upon the maintenance of smoothness, straightness, and original condition of the bore. The bore is likewise the most difficult portion of the weapon to keep in condition because it is difficult of access, but particularly because the firing of the cartridge deposits in it a fouling which will quickly start rust, and which is extremely difficult to remove by ordinary or old fashioned methods, although it quickly and easily responds to the proper and scientifically correct method.

To appreciate the stern necessity for giving the bore the best and correct treatment, and the reasons for the various steps, it is necessary that the shooter should know something of the fouling which takes place in the bore of his weapon when a cartridge is fired therein.

The fouling must be divided into, and considered under, three heads. It is not one combined mess as most people think, but three distinct kinds of residue, each entirely different in its action and effect, and each requiring an entirely different treatment to remove it or to counteract its effect on the steel surface of the bore. These three kinds of fouling are:

Primer fouling, being the product of the combustion of the primer composition or cap composition.

Powder fouling, being the product of the combustion of the powder used to propel the bullet.

Metallic fouling, being a coating of metal from the surface of the bullet or charge of shot which has adhered to the surface of the bore by reason of the friction, pressure, and heat.

We will consider these three kinds of fouling in the order given above:

Primer Fouling.—Almost all modern primers, particularly those required to ignite smokeless powder, contain a large proportion of potassium chlorate. On combustion, potassium chlorate becomes potassium chloride, which is salt very similar to sodium chloride or plain table salt. When dry this salt causes no damage to the steel surface of the bore, but it very quickly absorbs moisture from the air, and anyone knows what will happen to steel if we coat it with wet salt. Indeed potassium chloride, or primer fouling, is the main cause of corrosion in the bore of firearms. On a dry day this salt absorbs moisture rather slowly, but it always becomes completely saturated by nightfall, at which time the dampness of the air always increases considerably, even in the dryest desert. On a damp day the salt becomes saturated with moisture practically as soon as the rifle barrel has cooled from the heat of firing.

Like common table salt, oils and greases have little effect on potassium chloride. It is soluble only in water or in aqueous solutions like ammonia water. It can easily be swabbed out of the bore by water, or washed out by pouring water through the bore. It can also be covered up with grease so that water or dampness cannot get at it, but in this case it is still there, ready to cause trouble just as soon as there comes a break through the greasy covering which will permit moisture to get at it. Swabbing the bore with oils has very little effect on it, simply resulting in smearing it into all the little cracks, crevices, and holes in the metal, where it quickly starts rust. In some cases, however, the effect of this salt is practically neutralized by its chemical action with certain kinds of powder fouling, as we will see below.

Powder Fouling.—Contrary to popular belief, powder fouling causes very little trouble in the bore of firearms. Each kind of powder has a certain pressure at which it burns at its maximum efficiency. The cartridge company sees to it that the right kind of powder is used in each cartridge so that the powder is burned at its right pressure. Under these conditions the residue of powder is nothing more than a slight carbon ash. It looks dirty, but it causes practically no trouble except that sometimes it is ironed out over a small portion of the bore in a little hard coating, is hard to remove, and may have corrosive primer fouling under it which will cause rust in time. Powder fouling is readily soluble in certain chemicals, the best of which enter into the composition of STAZON POWDER SOLVENT. It is extremely easy to remove powder fouling with this preparation. Even when powder fouling is caked and ironed onto the bore it will respond to STAZON POWDER SOLVENT with a few moments of swabbing, but to save time and labor it is best to apply the solvent on a brass wire bristle brush, or the brass gauze shotgun cleaner, which will result in its being scratched loose immediately.

Metallic Fouling.—This is metal from the jacket of the jacketed bullet, from the surface of the lead bullet, or from the pellets of lead making up the shot charge of a shotgun. It may thus be cupro-nickel, nickel, copper, tin, or lead, or a combination of any two or all of these metals. It

appears either in the form of a slight, sometimes almost invisible wash or plating over the entire surface of the bore, or else in the form of lumps, flakes or scales of metal adhering to portions of the surface, and thick enough to be clearly seen on close examination of the bore in a good light.

Metallic fouling is dangerous to the bore in two ways. Whether it is in the form of a slight plating, or in lumps, it may cover up and hold under it the primer fouling. In such a case no amount of cleaning will remove the corrosive primer fouling until the metallic fouling is first removed. Moreover the presence of two metals (steel of the bore and metallic fouling) and the potassium chloride may make a miniature electric battery which will hasten the pitting or rusting of the steel.

The other way in which metallic fouling is dangerous is that if it be deposited in lumps, flakes, or scales, until it is removed, it will probably cause the weapon to become inaccurate by deforming the bullet as it passes over the lumps, or by ruining the pattern of the shot charge. Or in very exaggerated cases this fouling may cause sufficient obstruction to the bore to cause serious injury to the surface of the bore at that point, or the barrel may even burst through the restriction.

Metallic fouling should always be removed as soon as it is noticed. If it be cupro-nickel, nickel, or copper it is easiest removed with a strong solution of ammonia as will be described later. If it be lead it can usually be removed by a vigorous application of a brass wire scratch brush, or in an obstinate case the lead can be amalgamated by mercury.

The above describes the different kinds of fouling in the bore of a firearm, and in general their effects, but there are some exceptions to these which must be considered briefly. We have seen that the primer fouling is the cause of most of the rust or corrosion in the bore, or rather that this fouling, combined with the water which it absorbs, is so responsible. We had no particular trouble with this fouling in the old days when we used black powder because black powder is composed of potassium nitrate, sulphur, and charcoal. Under combustion the potassium nitrate reduces to potassium carbonate. The carbonate, being an alkali, will neutralize any acid, and will thus prevent rust. Any rust which occurred with black powder was probably due to the bulky fouling not being cleaned out and absorbing moisture, or to the bore not being protected from moisture in the air by a covering of oil or grease.

Primer fouling is also less liable to cause rust when the cartridges are loaded with a low pressure bulk smokeless powder, as in shotgun ammunition, pistol ammunition, or in reduced charges used in high power rifles, because such powder usually contains a large amount of barium carbonate and nitrate which neutralize the acid and leave an alkali residue in the bore. There is very little danger of rust occurring when ammunition containing these powders is used, but with all high pressure powders burning at their proper pressures, the fouling is almost completely neutral as we have seen, and has no effect on the primer fouling. Thus the potassium chlorate is practically unaltered, and it gets in its work on the steel as soon as it absorbs moisture from the air.

We have spoken about high pressure powder burning at its proper pressure not giving a harmful fouling. But sometimes it does not burn at its proper pressure, as for example, when a novice proceeds to load a cartridge with a very small charge of high pressure powder in an attempt to get a reduced load. In such a case the residue of the powder may be very highly acid, and combined with the primer fouling, it may cause rust to form in a very short time, even in an hour or so. It also happens that sometimes a very small cartridge is loaded with a very small amount of powder, and uses a very large primer relatively. In such a case there is so much primer fouling in proportion to the powder fouling that rust occurs very quickly indeed, despite most careful cleaning. A very little rust occurs every time the weapon is fired, and while it cannot be noticed at any one time, yet each time it eats into the bore, and finally its effects begin to appear and progress steadily. This is the case with .22 caliber rim fire smokeless cartridges which require a relatively large and corrosive primer to ignite the powder, and with small center fire smokeless cartridges like the .25-20. At the present time there is no known way of effectually preventing ultimate corrosion and pitting of the bore when such ammunition is used.

To appreciate more fully the action of the fouling in the bore, and the danger of corrosion therein, we should know a little about the surface of the bore. Look through the bore of a new firearm and it looks shiny and bright. This is the condition you want to keep it in. But cut the bore in two longitudinally, sectionalize it, and then examine it under a powerful magnifying glass, and you will probably be horrified by its appearance. You will see that the surface of the metal which you thought was perfectly smooth, in reality is seamed and crisscrossed with a multitude of small scratches, channels, grooves, and holes. Now imagine going over this surface with a greasy rag after the barrel has received a complete coating of potassium chloride. You don't dissolve the salt, you simply smear it down into all the scratches, grooves, and holes where it remains, and as soon as it gets damp it starts the little demon rust. But again imagine pouring water over this surface. The water dissolves the potassium chloride and washes it completely away. Then you go over it again with a dry absorbent rag and you dry out all the water, and rub the surface nice and clean. Finally you coat the bore with an absolutely neutral and thick grease like STAZON which "stays on" where you put it, and does not run off. The result is you have rendered the surface of the steel practically chemically clean and dry, and you have also thoroughly protected it from dampness in the atmosphere. That surface cannot then rust or deteriorate in any way, provided nothing comes into contact with it which will rub off the grease. STAZON will not flow off, no matter how long the gun remains with the barrel standing straight up, nor will it flow off no matter how warm the weather, for example in the hot desert or in the tropics.

Figure 1. Cleaning a rifle from the breech

III
Cleaning of Rifles

The following instructions cover equally well the cleaning of the bores of all types of rifles, that is high power rifles shooting jacketed bullets, low power smokeless rifles, black powder rifles, and all .22 caliber rim fire rifles. For a description of the various implements to use, and the exact method of their use, see Chapter X.

Two methods of cleaning are given, the Water Method, and the Solvent Method. The first is a little better and surer, but it takes more time and care. If the shooter be methodical and careful it is perhaps better to use the Water Method whenever possible, reserving the Solvent Method for an emergency, or when in a hurry. But for careless people who are liable to leave dampness in the bore, the Solvent Method is far better.

The Water Method

The bore of the rifle should be cleaned in the following manner as soon as possible after firing, and never later than the evening of the day on which it is fired.

1. *Pour several quarts of water, preferably hot or boiling, but not necessarily so, through the bore.* The water should be poured in the breech and out the muzzle, holding the barrel vertically, and care should be taken not to get any water in the mechanism, nor spill any over the exterior of the arm. This is best accomplished by having a small funnel, to the spout of which has been secured a short length of rubber tube which is inserted into the chamber. Or a most convenient tube and funnel is made for bolt action rifles which makes it possible to pour the water through without the slightest danger of getting even a drop anywhere but through the bore. If none of these conveniences are at hand, then it will suffice to swab the bore thoroughly with four or five flannel patches saturated in water, and worked back and forth through the bore on the cleaning rod. Or the muzzle may be stood in a shallow pan of water, and a flannel patch on the rod run back and forth through the bore, thus pumping the water up and down and washing thoroughly. The object of this water treatment is to dissolve and wash out every trace of primer fouling, that is the salt known as potassium chloride.

In lieu of water stronger ammonia, or aqua ammonia, 26 to 28 percent, may be used, applying it on flannel patches swabbed through the bore with the cleaning rod. Ammonia does as well as water, perhaps a little better, but it is expensive, it is disagreeable to use, and every trace of it must afterwards be removed, for if it is allowed to evaporate on the steel it will probably cause a bad case of rust. On the whole ammonia hardly pays for itself as compared with just plain water.

2. *While the bore is still wet, scrub it for four or five strokes with a brass wire bristle brush.* The object is to loosen up any powder fouling

which might have become ironed to the surface of the bore. It will also almost always loosen any lead that may have adhered to the bore when lead bullets have been used. The brass brush is really merely a labor saving device, its use sometimes making it unnecessary to spend five or ten minutes swabbing the bore with flannel patches to remove powder fouling which may have caked therein. The brush should follow the rifling, and should not be pushed straight through the bore and across the lands. To insure its following the rifling it is best to screw it only half way on the tip of the rod. Only brass brushes should be used. An ordinary pig bristle brush will not remove the fouling, and all steel brushes are very injurious and should never be used in any firearm. A brass brush soon wears out, one being efficient for only ten to twenty cleanings.

3. *Clean and dry the bore thoroughly by swabbing it with dry, clean flannel patches, used on the cleaning rod.* Each patch should be pushed through the bore, back and forth, for about five to ten times, then discarded, the rod wiped off with a dry rag, and another patch used in a similar manner. It will take from ten to fifteen patches to thoroughly dry and clean the bore. Be absolutely sure that the bore is thoroughly dry before you cease this portion of the cleaning operation. The flannel patches will never come out absolutely clean, because even clean steel will slightly soil a patch, giving it a slight light gray smear. But the patches should run very freely through the bore, and should be coming out with only a slight gray discoloration before you stop.

Now look through the bore from either end, holding the opposite end up toward the sky or a lamp, and see if it is clean, shiny, and free from all dirt. With high power rifles having a muzzle velocity of over 2,000 feet per second, particularly if they have been fired with bullets having cupro-nickel jackets, you should inspect the bore most thoroughly when looking in at the muzzle end. Look particularly for little lumps or smears of metal of about the color of bright lead adhering to the bore, particularly to the tops of the lands near the muzzle and for about eight inches down from the muzzle. This is lumpy or flaky metal fouling, and if it is present, even if there is only one flake or lump of it, it should be removed at once as described in Chapter VII. If, however, as will be usually the case, the bore appears to be perfectly dry and clean, protect it with a film of good gun grease as described below.

4. *Swab the bore thoroughly with a flannel patch heavily saturated with a good gun grease.* The third operation rendered the bore practically chemically clean and dry, and the object of this swabbing with grease is to give it a coating which will protect it from dampness which it might absorb from the air. The coating should be put on heavy, and it should be sufficiently swabbed to insure every portion of the bore and chamber being completely covered—no exposed spots. The character of the grease used is very important indeed. It should be absolutely neutral, and it must be acid free. It should be thick enough not to flow, even when the rifle is stood up for a long time with the barrel vertical, and it should stand high temperatures with no indication of flowing off, so that storage

in a hot attic in the summer, or in the tropics, will not cause it to flow and expose spots of the bore to the damp air. The gun grease which most perfectly fills all these specifications is STAZON. A fairly heavy and complete coating of STAZON will protect any clean steel surface from rust indefinitely under any natural condition.

5. *As a precaution, examine the bore again about 24 to 72 hours after the first cleaning.* With flannel patches, wipe all grease out of the bore, then use several more dry flannel patches on the cleaning rod to get the bore perfectly clean again. Look through the bore from breech and muzzle to be sure that it is clean. Then again swab it thoroughly with STAZON. It is wise also to examine it again a week or so later, and again to apply STAZON. The rifle can then be packed away for an indefinite time, with the assurance that if it is stored in a fairly dry place, as described in Chapter IX, that it will stand for years without deterioration. Sometimes, however, the rifleman may be compelled to place his weapon in store immediately after the first cleaning, and within a few hours after completing firing, and this will of course preclude these subsequent cleanings. In such a case it is best to give the bore the regular treatment for metal fouling with the strong ammonia solution, in which case it can be placed away immediately with the assurance that a heavy coating of STAZON will fully protect it for all time.

6. *Wipe all grease from the bore and chamber before starting to fire.* This is a very necessary precaution. Grease in the bore and chamber will give very high breech pressure if a cartridge be fired with the barrel in this condition. A heavy coating of grease may even cause the barrel to split wide open, or it may generate such breech pressure that the brass cartridge case will give way in the head, and the strong powder gas may blow back and demolish the breech mechanism, perhaps causing serious if not fatal injuries to the shooter. For the same reason never place any grease on the bullet or cartridge case before inserting them in the chamber. The presence of heavy grease in the bore also causes the rifle to shoot wildly and inaccurately.

Sometimes the hunter may have to carry his rifle all day in a damp climate, or through the rain, and he may dislike leaving the bore dry and entirely unprotected. In such a case there is no objection to his slightly saturating a flannel patch with a light mineral oil like STAZON GUN OIL, and lightly swabbing the bore with this, leaving a light coating in the bore, which will perfectly protect it for several days.

Also where the rifleman is shooting every day, a light oil like STAZON GUN OIL may be used to protect the bore after cleaning until the next day. Indeed this is the usual practice in competitions where firing is going on every day, as it is much easier to wipe out a light coating of oil before starting firing than a heavy coating of grease. But light oil will not thoroughly protect a steel surface like the bore of a rifle for long, as it soon flows off, leaving exposed surfaces.

Figure 2. Cleaning a rifle from the muzzle, using a muzzle guard

The Solvent Method

This method is not as sure or as safe as the Water Method, nor are so many precautions necessary. It is a quicker method, and an easier method. It is the method to use in an emergency when one has not the time for the Water Method. It is the method for the lazy man, for the constitutionally careless man, or for the big game hunter when he comes in from a long day in the mountains so tired that he is inclined to let the rifle go over night. It is fairly good, the chief trouble being that it does not surely prevent a very slight superficial rusting at times.

1. *Clean the bore with a first class powder solvent as follows:* First saturate a flannel patch thoroughly with the powder solvent, and push it straight through the bore with the cleaning rod, and out the other end. Next put a few drops of powder solvent on a brass wire bristle brush, and scrub the bore with the brush on the cleaning rod. Run it back and forth through the bore ten or fifteen times. Finally again swab the bore with several flannel patches wet with the powder solvent. It is most necessary that a thoroughly reliable and efficient powder solvent be used, one that contains the very best solvents of nitro-cellulose and nitro-glycerine, and that is at the same time neutral. A little alkali is not objectionable, but the solvent positively must not contain acid. There are a great many absolutely worthless so called powder solvents on the market, some of them being very extensively advertised and praised up. There are also some few absolutely dangerous solvents, one of which, also very extensively advertised, contains fifteen percent of acid. There are also two or three good ones. Perhaps the very best, and a thoroughly efficient one, neutral and absolutely free from acid, is STAZON POWDER SOLVENT. The shooter using this method of cleaning would do well to use this solvent exclusively.

2. *Clean and dry the bore thoroughly by swabbing it with dry, clean flannel patches used on the cleaning rod.* This is the same as operation No. 3 in the Water Method, which see.

3. *Swab the bore thoroughly with a flannel patch heavily saturated with a good gun grease.* This is the same as the fourth operation in the Water Method, which see. In this case, however, it is very necessary that a heavy grease be used. One is necessary that has absolutely no tendency to run and leave spots exposed, for it must be remembered that the cleaning with a powder solvent does not result in getting all the primer fouling out of the bore, and to prevent rust occurring we must so cover up the surface of the steel that the potassium chloride remaining positively cannot get a chance to absorb moisture from the air. For this reason, when cleaning with this Solvent Method, thin oil or another coating of powder solvent should never be used at this stage, even if one is going to fire his rifle again on the following day. Everything here indicates the use of STAZON. It is heavy, it gives a thick enough coating, spreading evenly over the entire bore, and particularly as its name indicates, it "STAYS ON."

Figure 3. Cleaning rifles, using a cleaning rack

4. *Clean the bore again about 24 hours after this first cleaning.* This is most essential when using this Solvent Method of cleaning, for sometimes the potassium chloride remaining in the bore may have absorbed some moisture from the air, and may have started a slight superficial corrosion, and it is necessary to nip this in the bud. First wipe out the heavy coating of gun grease, and then clean again exactly as described above, or (much preferably) clean with the Water Method if you have time, and get rid of the potassium chloride entirely. Remember that potassium chloride (the primer fouling) is soluble only in water or aqueous solutions. In this Solvent Method we have endeavored to wipe out as much of it as possible by a thorough swabbing with powder solvent. In most cases we get almost all of it out, but there is always a trace remaining, and this trace may cause a lot of corrosion if the bore be not cleaned repeatedly and watched carefully for a week or so after it has been fired.

There is no use denying the fact that the Solvent Method is a makeshift, and not thoroughly effective. And yet it is the most popular method. In the first place it rather goes against the grain of many shooters to use water on their guns. They have always been taught (erroneously) that water is the one thing that they must most carefully keep away from a fine gun. Moreover it is so easy to spill water all over the interior and exterior of the gun, and then if time be not taken to dry it most thoroughly rust will soon appear. Many careless men will spill the water anyhow, no matter how much you caution against it, and also they will not surely get the bore perfectly dry after using water. But the shooter may spill powder solvent all over his weapon anywhere, and not wipe it off, and the solvent will cause no harm, in fact it will probably do good. With a careless man a rifle will probably be in better condition after a season's use if cleaned by the Solvent Method, than if cleaned with the water method, but it will not be in nearly as perfect condition as a rifle used to the same extent which has been carefully cleaned by the Water Method.

5. *Wipe all grease from the bore and chamber before starting to fire.* This is a very important safety precaution. See the sixth operation under the Water Method.

Cleaning the Chamber

It is just as necessary to keep the chamber clean as to keep the bore in condition. In the majority of cases, however, the various operations of cleaning the bore, as described above, result in giving the chamber all the cleaning that is necessary. It is necessary to mention that the chamber needs cleaning because sometimes if one has a rifle that has to be cleaned from the muzzle he may insert a plug in the chamber to keep the cleaning patches from running down into it and thus coming off the rod, and he may complete the cleaning of the rifle without giving any attention to the chamber. Also a shooter may be using a cleaning tube which permits of easily cleaning the bore through the tube, and may neglect the chamber. The chamber is easily cleaned by using a short wood cleaning

rod, too large to enter the bore, and cleaning the chamber from the breech with STAZON POWDER SOLVENT on flannel patches, then wipe dry, and grease with STAZON GUN GREASE. Be very careful, however, to wipe all grease from the chamber before firing or a dangerous accident may occur. See the sixth operation under the Water Method.

Field Cleaning

The hunter or soldier may have to stay out over night or longer away from his main camp, and hence away from his cleaning rod, brass brushes, and flannel patches. His rifle may have been shot during the day, and he wants to give it some treatment which will prevent its rusting over night. If he is in the military service, or if he be an experienced sportsman, he has a trap in the butt-plate of his rifle. Under this trap, in recesses cut for them in the stock, there should be a field cleaner or pull through, a brass wire bristle brush that will fit on the field cleaner, a small can of STAZON GUN OIL, and a few flannel patches cut to the correct size for use with the field cleaner.

First he should put a few drops of oil on the brass brush and pull it four or five times through the bore. Then follow by pulling several flannel patches through to partly clean the bore and remove most of the fouling. Finally pull through one patch several times that has been saturated with STAZON GUN OIL. This is only a "lick and a promise," but it will prevent any serious rusting taking place. On reaching the main camp the rifle should of course be thoroughly cleaned. When out this way without proper cleaning facilities for several days at a time it is always well to fire several shots in quick succession through the bore every day. The heat of firing will thus kill any rust that may be forming.

Sweating Out

We often hear the term "Sweating out," used. Some people assert that the gases under high pressure are driven into the pores of the steel, and sweat out for several days afterwards. This is all bunk. What is really happening is that the primer fouling, the potassium chloride, has absorbed moisture from the air. This potassium chloride has not been entirely removed from the surface of the bore, and it is running a little rust factory in the bore. If you wash all the potassium chloride out by a thorough running of warm or hot water through the bore, as directed under the Water Method, you will have no sweating out unless you also have a lot of metal fouling which has imprisoned potassium chloride under it so that the water cannot get at it to wash it out. In this latter case, if you remove the metal fouling as directed in Chapter VII, you will have no more sweating out. Sweating out is really after corrosion.

IV
Cleaning of Shotguns

The bore of a shotgun is not as difficut to clean as that of a rifle. The bore of the former is smooth, the pressure is not as high, and metallic fouling when present is only in the form of a slight smear of lead, easily scratched off. But the saving clause is that the primer fouling is not nearly as corrosive in a shotgun that has been fired as it is in a rifle, due to the neutralizing effect of the particular kind of powder used in shotgun cartridges. For these reasons, and particularly on account of the latter reason, it is not so necessary to wash out the fouling with water or with other aqueous solutions. Water may be used, and is a cheap way of cleaning, but it is rather tedious because it takes so long to get the barrels perfectly dry after using it, and the careless man is always apt to slight this operation, in which case rust is almost sure to result from the dampness remaining.

Powder solvent is a most excellent cleaner for shotguns, that is provided that a good solvent is used, containing the right ingredients, a proper proportion of oil, and particularly one that is absolutely free from acid. This is best assured by using STAZON POWDER SOLVENT which will be found perfect in every way.

The bore of the shotgun should always be cleaned as soon after it has been fired as possible, and never later than the evening of the day on which it was fired. If left dirty over night a slight rusting will almost always have occurred. Repetitions of this neglect will soon result in a pitted bore, the pattern will have been injured, and it will be increasingly difficult to keep the bore clean. Complete ruination of the gun is very liable to follow. Your gun should always be cleaned before you go to bed.

Dismount the barrels from the action. Screw the little saucer shaped steel wire brush on the cleaning rod, and cover it with two thicknesses of flannel patch saturated in STAZON POWDER SOLVENT. The patches should be about two inches square, and should cover the entire convex portion of the brush so that no steel will touch the surface of the bore. This is the very best arrangement for a swab, as it is just tight enough, it is easy to change patches, and the patches hold secure.

Insert this swab at the breech and push it clear through the bore and out the muzzle, unscrew the brush from the rod (for you cannot pull it back through the bore) and discard the flannel patches. This results in pushing the great bulk of the fouling out of the bore and making future cleaning easier and less messy.

Again put patches saturated with powder solvent on the steel brush. Place the muzzle of the barrels on a clean sheet of newspaper resting on the floor. Now thoroughly swab the bore with the saturated patches, pushing the brush down to the newspaper, but not out of the muzzle, and then pulling it back again to the breech. Let the patches work back and forth a dozen times or so, being sure each time that they run completely

down to the muzzle. It will require a little extra push to get down the last inch of bore due to the tightness of the choke. Then discard these patches, and with clean, dry flannel patches, used in exactly the same way, clean and dry the bore.

After having gotten the bore dry, scrub it for a dozen strokes or so with a brass wire bristle brush on the cleaning rod. Or you may use any of the patent cleaners which contain brass wire gauze. But do not use a steel wire brush, no matter if the salesman does tell you that it is soft steel and will not scratch the bore. Practically every steel brush will scratch the surface of the bore of a shotgun, and they should never be used except when covered thickly with the flannel patches as already described. The object of this scrubbing with a brass brush is to remove any slight smears of lead that may have been deposited on the bore from the shot charge.

Following the brass brush, give one more swabbing with flannel patches saturated with STAZON POWDER SOLVENT, and then with dry, clean flannel patches on the saucer shaped brush, most thoroughly dry and clean the bore. Use plenty of elbow grease so as to get up friction, and keep up the swabbing if possible until the barrels become slightly warm.

Finally, saturate patches heavily with a good gun grease that does not contain acid. Beware of cosmoline and vaseline. Some of these preparations are all right, but by far the greater number of them contain a certain proportion of acid, and will finally cause rust. The very best grease to use is STAZON. It is absolutely neutral, contains no acid, and it will stay on the bore as it does not flow under any natural temperature, and leave spots unprotected.

The bore is now clean and perfectly protected, and no more attention is necessary, although, if the weapon is to be put away for a long time where it will not receive periodical examinations, it is best to wipe out this grease several days later, again swab the bore with flannel patches that have been slightly warmed over the stove to be sure that they are absolutely dry, and then apply another heavy coat of STAZON GUN GREASE.

Before shooting the gun again it is best to remove most of the gun grease by pushing one dry swab through the bore and out the muzzle. In a duck blind, and in damp rainy weather one should keep a light, thin coating of STAZON in the bore, not a heavy coating, but just enough to make the bore shine well. This will thoroughly protect it during the day, and at the end of the very worst possible weather the bore will be found in perfect condition without a speck of rust. Indeed this method of cleaning will preserve the bore of any shotgun, using any kind of ammunition practically indefinitely, so that if the gun has been originally of good and sturdy make it will last the owner a lifetime.

For the care of the exterior of the shotgun, the stock and the locks, see Chapter VI.

V
Cleaning of Revolvers and Pistols

The cleaning of the bore of revolvers and pistols is a rather simple proposition when properly done. The fouling is not very corrosive, the primer fouling being to a great extent so modified by the powder fouling that is has lost most of its corrosive qualities. It is very seldom indeed that any metal fouling occurs, and the pressure is very low. The best cleaning agent is a good powder solvent. There are many solvents on the market, some very good, but many practically worthless. Some contain acid which is bound to be very injurious to the weapon. STAZON POWDER SOLVENT is one of the very best and is absolutely neutral, and most perfect for the cleaning of revolvers and pistols.

The revolver or pistol should be cleaned as soon as possible after it has been fired, and certainly not later than the evening of the day on which it was fired. Never let any weapon stand over night without cleaning as it is sure to develop a case of rust.

Clean the barrel from the breech if possible, but on most revolvers and pistols this is manifestly impossible due to their mechanism. In cleaning from the muzzle be sure to guard the muzzle from injury, and do not let it be rubbed by the cleaning rod. Saturate a flannel patch with powder solvent, and with the cleaning rod push it straight through the bore and out at the other end, and discard it. This removes the bulk of the fouling, and makes the remainder of the cleaning easy, and a much less messy operation. Now saturate another flannel patch with powder solvent, and thoroughly swab the bore with it, holding the finger over the opposite end of the bore to which the cleaning rod is entered, and working the patch back and forth a number of times. Follow by swabbing with five or six clean, dry flannel patches until the bore appears clean and perfectly dry. Toward the end of this swabbing with clean patches it is well to make it energetic enough so that the friction will make the bore slightly warm, thus insuring that no moisture will be left in the bore.

If the weapon is a revolver, clean the cylinder and each chamber in exactly the same way. In cleaning the cylinder let the disengaged hand hold the cylinder itself. That is do not hold the frame in the left hand while cleaning the cylinder with the rod in the right hand, for this might result in straining the cylinder hinge joint and thus throw the cylinder out of alignment with the barrel and make the weapon inaccurate.

Having cleaned and dried both the bore of the barrel and each chamber, they should then be protected by a coat of good gun grease applied on a flannel patch with the cleaning rod. Use a good grease that is free from acid, and which will not run when exposed to extremes of temperature. STAZON is a most excellent preparation for such use.

Be sure to wipe all grease from the bore before starting to shoot. Grease in the bore may cause the weapon to shoot rather wildly, that is if a heavy coat be left in. Of course one often wishes to keep a revolver

or pistol in condition for instant use, in which case apply just a very light coat of STAZON, just enough to make the bore and chamber shiny, or STAZON GUN OIL may be used instead of the grease.

Some modern automatic pistols and revolvers use ammunition having metal (copper) jacketed bullets. With such it is well to scrub the bore for a few strokes with a brass wire bristle brush. Do this after cleaning with the powder solvent, and then follow the use of the brush with another light swabbing with powder solvent before drying and applying the gun grease.

After having cleaned the bore and cylinder, go over the exterior of the weapon with powder solvent, being sure to get into every crack and joint, particularly around the breech of the barrel and the muzzle of the chambers in a revolver. This will take off all the powder smudge on the exterior of the weapon, this smudge sometimes sticking rather tightly and being hard to remove if powder solvent be not used. Then wipe off the whole exterior of the weapon with a dry rag, and then go over it with a rag or a chamois skin saturated in STAZON GUN OIL. In this condition return the weapon to its holster, handling it by the stock only, and not permitting the hand or fingers to touch the oiled surface. Examine the weapon again within the next week to see that no rust is starting anywhere. With a revolver or pistol using .22 caliber rim fire ammunition it is well to make this examination within a couple of days after firing, as these weapons are a little more prone to after corrosion than those of larger bore, and such corrosion is apt to start sooner with them. But generally speaking it is very seldom that after corrosion occurs with revolvers or pistols cleaned in this manner, and when it does it is almost always due to acid contained in the powder solvent, grease, or oil, which is another argument for the exclusive use of ingredients that are absolutely known to be free from acid, such as the STAZON PRODUCTS.

It is well to investigate the holster in which the weapon is kept. Some leathers have the property of absorbing considerable moisture from the air, and such should never be used for holsters. It is well to keep the holster well saturated with neatsfoot oil to prevent its absorbing moisture, but even this oil will not prevent some leathers from becoming dangerously saturated with moisture.

VI

Care of the Exterior and Breech Mechanism of Firearms

A gun may be rusted, scratched, and worn outside, but yet if the bore, chamber, and mechanism be in good condition it may still shoot just as efficiently as ever. But this is no excuse for neglecting the exterior of a weapon. A shooter will never take much interest in, nor develop any amount of skill with a weapon of which he is not proud, and he can hardly have much regard for a gun which has been permitted to become

rusted and unsightly on the outside. Legitimate wear can hardly be objected to, in fact is often something to be proud of as indicative of much use afield, but for rust there is no excuse as it is so easy to prevent it. All that is needed is an ounce of prevention at the proper time, and the observance of certain precautions.

When a gun is carried afield the hands very quickly wipe off of its exterior all the protective coating of grease or oil. Perhaps it gets wet or muddy, or ones hands perspire. It is then in a condition to rust very quickly if not cared for. In fact rust will often start during a day's sport under such conditions, particularly on very damp days, in a duck blind near salt water, or in the tropics. The bore and mechanism are not in much danger from rust due to these causes because they can be given a thin coating of grease or oil, and under ordinary use this will not be wiped off by the handling. Perspiration from the hands will cause rust quicker than water or mud.

When one comes into a house or camp at the end of a day's hunt, or after a day on the range, he should, in addition to caring for the bore, wipe off the exterior of the weapon, first with a dry rag to get it clean and dry, and then with an oily rag, or preferably a chamois skin which has been saturated with oil. The whole exterior should be gone over in this way, and then the weapon should be put in its case or rack *without permitting the hands to touch the metal parts.* On a damp or very rainy day afield it is well to carry a dry and an oily rag and do this same thing at noon. Ordinarily this is all the attention that the exterior requires.

In some cases a little more strenuous precaution is necessary. For example in a duck blind, particularly near salt water, it is difficult to prevent rust, but if the shotgun be given a heavy coat of a good thick gun grease which has the property of staying where it is put and not flowing, like STAZON, the weapon will go through the entire day without a speck of rust and be easy to clean off at night. Sometimes sweat or mud has so dried on the gun that it is difficult to get it off by wiping with the dry rag. But it can always be cleaned off instantly with a small piece of rag saturated with STAZON POWDER SOLVENT.

In very cold climates a gun that has been exposed to the low temperature outside all day long, and is then taken into a warm house or cabin, will condense moisture on every part. In fact it quickly becomes as wet all over as though it had fallen into water. It is always best to leave the weapon outside under such conditions. Indeed in Alaska in the winter the sourdough always leaves his rifle *outside* his cabin door. If this is not possible, or in similar cases, for example where a gun has fallen into the water, it should be taken apart, every part wiped dry, and then oiled.

Gun cases are great promoters of rust on the exterior of guns, particularly those cases that are lined with flannel. The flannel absorbs moisture which in turn rusts the weapon. The best gun cases are those made of heavy waterproof canvas without any lining of any kind. But it is best to avoid cases entirely, and to keep guns in cabinets, not the fancy

cabinets lined with billiard cloth, but ones with plain interiors where the guns are supported by wood only at butt and muzzle, and without anything inside that would absorb or hold moisture.

In handling a gun, in showing it to friends, etc., handle it by the stock and forearm only, not letting the hands touch the metal parts. Finger marks are great promoters of rust, and many a firearm has developed a rust spot because some ignoramus took it, unknown to its owner, from the rack and handled the metal parts with sweaty hands. Keep a rag to wipe off guns after they have been handled by admiring friends.

The wiping off of the stock with the oily rag at the same time that the metal parts are given attention will keep it in good condition, but occasionally, particularly after the weapon has become wet on a rainy day, it should be given a coat of linseed oil, rubbed in with the palm of the hand. Merely put about half a teaspoonful of linseed oil in the hand and rub down the stock and forearm, continuing the rubbing until the oil has been practically rubbed into the wood, and the surface is almost dry. Do not leave a heavy coating of linseed oil on the stock to dry, as it will gum and become hard and unsightly. Wipe any linseed oil off the metal parts that may have gotten on them while treating the stock.

Occasionally all the little crevices, corners, and screw heads should be given attention. Brush them out clean and free from gummy oil with an ordinary stiff paint brush, and then go over them with oil on a match stick. Do this always if putting the weapon away for a long time. For the best method of placing firearms in store for indefinite periods see Chapter IX.

So far we have had little to say about the breech mechanism of rifles and shotguns. Like any other machine, these must be kept clean and lubricated or they will eventually cease to function. Keep all the breech mechanism wiped clean and lubricated with a good lubricating oil. The oil should be heavy enough to be a good lubricant, and not so light that it will flow off and leave parts without any lubrication and exposed to moisture. Many so called gun oils and sewing machine oils are so thin that they are practically useless for this purpose. STAZON GUN OIL has just exactly the right consistency for the mechanisms of rifles, repeating shotguns, and autoloading weapons. It also has one great advantage for use in cold climates in that it does not become thick or solid in very low temperatures. Many oils become almost solid when the temperature gets down around Zero, and completely prevent the weapon from working, a very dangerous matter in hunting some game.

The locks of some of the high grade double barrelled shotguns and single trap guns are so carefully made, and so closely fitted that they require special treatment and lubrication. Many of them are like fine watches, and require watchmakers oil applied very gingerly with a feather. Such weapons ought really to be sent to the makers once a year for the overhauling of the locks, and ordinarily no attention other than this is needed by the owner unless perchance the weapon has fallen overboard, in which case strenuous measures are indicated at once.

In the tropics it often happens that one is perspiring so freely that the mechanism gets quite flooded with sweat. In such cases it is necessary to clean it daily, and in this case screwdrivers are needed for taking the action apart, unless the shooter is lucky enough to be carrying a rifle with a military bolt action which can be dismounted entirely without tools in a few seconds. Such actions are very easy to keep in perfect condition. In the desert, too, sand will often get into the action and require it to be completely cleaned out, and in some arctic regions the fine dry snow which is constantly blowing around has much the same effect as sand on the mechanism. Under such conditions it is well to have a light canvas breech cover that can be tied over the mechanism with a slip knot.

VII

Removal of Metallic Fouling

The metallic fouling which is sometimes deposited in the bore of modern firearms can be divided into two general classes. First, cupro-nickel or copper from the jackets of the bullets used in high power smokeless rifles. Second, lead from lead bullets or charges of shot, this form being found in low power rifles using lead bullets, shotguns, and sometimes in revolvers and pistols. While metallic fouling is always present in the above weapons, it is rather seldom that it is present in sufficient quantity to give any concern or to make any particular attention necessary. But occasionally it does give trouble, and then it should be removed immediately or deterioration of the bore will be very rapid. As the two classes of metallic fouling require entirely different treatment for their removal, they are dealt with separately.

Cupro-nickel and Copper Fouling

This fouling comes from the jackets of the bullets used in high power rifles. The bore of a rifle, if we disregard the grooves and lands, looks very new and smooth to the unaided eye. But examined through a microscope it will be seen to be covered with minute cuts, scratches, and holes. The pressure exerted with rifles of ultra high velocity when the cartridge is fired is very high, being often as much as 50,000 pounds per square inch. Under this high pressure considerable friction occurs between the jacket of the bullet and the surface of the bore, and as a result small particles of the jacket are scraped off and adhere to the bore. These are securely ironed and welded thereon by the pressure of subsequently fired bullets which pass over them. These particles adhere so firmly that they cannot be removed by scratching, as with a brass brush, nor are abrasives the proper thing to remove them, as any abrasive which will have effect in a practical length of time on cupro-nickel or copper will also abrade the steel of the bore. The only satisfactory method of removing this fouling is to use a chemical which will dissolve it without having any effect on the steel. Such a chemical is ammonia.

To determine if metal fouling is present in the bore of a high power rifle, it should be cleaned as described in Chapter III. After the bore has been gotten clean, and before it has been greased, the breech should be held up to a good light, and the bore examined from the muzzle end. Look particularly at the top of the lands for about six or eight inches down from the muzzle. If the rifle be metal fouled one will see small specks, flakes, or lumps of metal adhering to the lands, and often to the grooves. They appear like smears or flakes of lead, apparently about one third as thick as the lands are high. If this kind of fouling is found it should be removed at once as it will interfere with the accuracy, and the bore may become seriously rusted under the flakes. To remove it, proceed as follows:

The bore should be made as clean as possible, but it should be carefully freed from all trace of oil or grease. Place a rubber cork of the proper size in the chamber so as to completely seal the bore at the breech and make it water tight. Place a rubber tube over the outside of the muzzle, this tube to be about 2 inches long, and to extend about 1½ inches beyond the muzzle, making a water tight joint at the muzzle. Stand the rifle up in a rack, barrel vertical, and muzzle up.

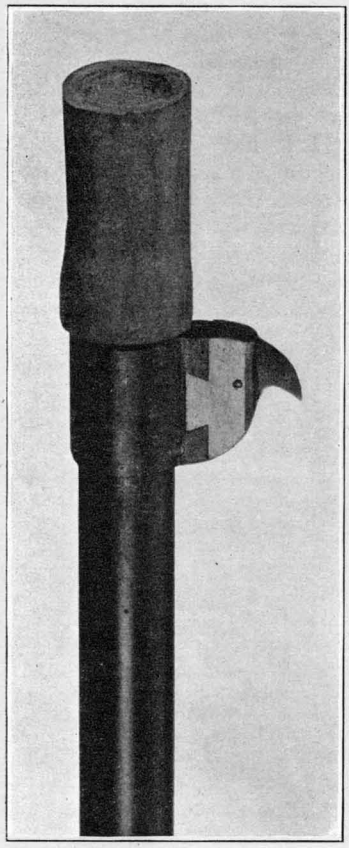

Figure 4. Rubber tube on muzzle of rifle, ready for applying metal fouling solution

Make up some of the following standard metal fouling solution:

Ammonium persulphate	½ ounce
Ammonium carbonate 100	grains
Stronger ammonia 26 to 28%	3 ounces
Distilled water	2 ounces

The first two should be powdered together with a small mortar and pestle, and mixed with the two latter ingredients. Stir a little and when all the powder has dissolved the solution is ready for use. The above amount is sufficient to clean a barrel three times. It is best kept by placing it in a bottle with a tight rubber clamp cork like the bottle that druggists usually sell citrate of magnesia in. Do not fill the bottle more than two thirds full as the solution generates a powerful gas which might blow the cork out or burst the bottle. Keep it in a cool place. The solution will keep all right for two to three weeks, but after that is liable to become dangerous in that it may rust steel. Use freshly mixed solution where possible.

Keep the bottle always tightly corked except for the few seconds necessary to pour out the amount required. If it loses its strength it not only will not dissolve the fouling, but it may rust steel quickly. The ingredients can be obtained from any large drug store, or from drug supply houses. Small druggists often do not know what the various ingredients are.

Carefully pour this solution into the muzzle of the rifle, through the rubber tube, until the bore is full and the liquid rises in the rubber tube. Take extreme care not to spill any on the outside of the rifle, and if you do spill it wipe it dry at once. Let this solution remain in the bore from fifteen to thirty minutes, never more than half an hour under any circumstances. When first placed in the bore it is colorless like water, but it soon assumes a deep blue color as it dissolves the cupro-nickel or copper. It is probable that it performs all its work in the first ten minutes. After the specified time reverse the rifle muzzle down, and pour out the solution. Still keeping the muzzle down, remove the tube of rubber from the muzzle, and insert a cleaning rod from the muzzle and drive out the cork from the chamber. Keep the muzzle down all this time so that no solution can flow back into the mechanism and cause rust. Now with the cleaning rod run one flannel patch through the bore from breech to muzzle, thus pushing out any solution that may remain in the bore. Then every trace of ammonia should be removed from the bore at once before it has had a chance to evaporate thereon. The best way to accomplish this is to run water through the bore by means of a funnel and tube or cleaning tube, and then to dry the bore thoroughly with dry, clean flannel patches on the cleaning rod. Then look through the bore to see that it is perfectly clean and free from metal fouling. If the bore appears perfect it only remains to give it a heavy coating of STAZON GUN GREASE and set it away. It will then be perfectly clean, and can be set away for a long time, or shipped to a distance with a surety that it will remain in perfect condition.

If, however, on looking through the bore some metal fouling still is present, run a brass bristle brush through the bore several times, being sure that the brush is clean and free from oil or grease, and again apply the solution in the same manner. Generally one application is all that is necessary to entirely free the bore from metal fouling.

Cautions and Suggestions.—So long as the ammonia retains its strength, and the steel remains wet with it, it will have no action whatever on the steel. If, however, it is allowed to evaporate on the steel it will quickly rust it. If it be permitted to stand for a long time exposed to the air the carbonate will evaporate and the resulting solution will rust steel rather quickly. Hence the precautions about keeping the bottle tightly corked, not spilling any over the rifle or in the mechanism, and putting a rubber tube over the muzzle so that none will evaporate on the steel at the muzzle of the rifle while it is being applied. It will also take the varnish and finish off the stock of a rifle very quickly if spilled thereon.

Never pour the solution into a barrel that is still warm from firing, for it will completely ruin the barrel in about three seconds. Always let the barrel cool before applying this treatment.

If metallic fouling has to be frequently removed it is very convenient to have a small glass vial which will hold just enough solution to completely fill the bore, thus obviating the danger of spilling by overflowing, and making the pouring easier and quicker. In the absence of a mortar and pestle the persulphate and carbonate may be powdered by placing within a fold of a clean cloth, and pounding with a hammer. If, before pouring the solution into the bore, a *steel* cleaning rod be placed in the bore (taking great care not to drive out the cork at the chamber) only about one fourth the amount of solution will be required to fill the bore, and as the solution is rather expensive this is quite an item. The action with the steel cleaning rod in the bore is just as complete and quick as without it, and the rod is not injured if wiped off afterwards.

The presence of oil and grease will saponify the ammonia, and prevent its dissolving the fouling.

Used exactly as described, this solution is perfectly safe and effective.

Removal of metal fouling with powder solvent.—A slight and fresh case of metal fouling may often be removed by an application of STAZON POWDER SOLVENT, or the solvent may remove so much of the fouling that one need resort to the regular ammonia solution only once in four or five days. The powder solvent should be applied on a brass wire bristle brush, and the bore scrubbed vigorously with it, using plenty of the solvent. The solvent has no effect whatever on the lumps of metal fouling, but it does dissolve what powder fouling may be lodged around and under the edges of the lumps, and often this results in the wire brush getting a hold of the lump and tearing it loose.

There are some powder solvents that are advertised to remove metal fouling by dissolving it. When left in the bore over night a green or blue color will be noticed the next day on wiping out. This has led people to believe that they really did have some action on the metal fouling, but this is all bunk. Such powder solvents contain a large amount of oleic acid, and this acid forms oleate of copper with the metal fouling, or just plain verdegris. As a matter of fact, practically none of the copper is dissolved. One should beware of such solvents, because if left in the bore for 24 hours or longer they will cause a black rust due to the oleic acid. The best way of avoiding them is to adopt a first rate neutral powder solvent like STAZON POWDER SOLVENT.

Bullets jacketed with gilding metal or Lubaloy (copper with a small percentage of zinc and sometimes tin) are coming more and more into use in high power rifle ammunition, and such bullets should always be adopted by the rifleman when possible. They can usually be told by their copper color, although some of them are tin plated and look like cupro-nickel jacketed bullets. These latter can always be told by polishing a bullet for a few minutes with brass polish or cutting with a knife,

when the copper color under the thin tin plating will appear. These gilding metal and Lubaloy jacketed bullets do not cause any lumpy metal fouling, and their use makes cleaning very much easier and simpler as it is entirely unnecessary to resort to the ammonia cleaning. They often will give the surface of the bore a very slight coating or wash of copper, and the bore may even sometimes take on a decided copper color. But it has been found that this wash is so thin that it can hardly be measured even with delicate instruments, and also that it does not accumulate or get thicker, no matter how much the rifle is fired. Also there seems to be an indication that this coating to a slight extent acts as a rust preventative.

Lead Fouling

This fouling comes from the lead bullets in rifles and pistols, or from lead shot in shotguns. It may appear as lumps near the breech (usually in rifles) or as a lead smear anywhere in the bore. It is sometimes quite prevalent when black powder is used, particularly when the weapon is shot on very dry days, the black powder fouling then lacking any lubricating qualities.

Lead fouling can almost invariably be entirely removed by a liberal application of a new brass wire bristle brush. If, however, this does not bring it all out, if it is a smear, it can almost always be entirely removed by a flannel patch liberally saturated with STAZON RUSTOFF. Swab the affected spot with patches saturated with the RUSTOFF for a few minutes.

Sometimes a flake of lead will resist all the above methods of removal. In such case clean the bore thoroughly, but leave no oil or grease in it, scratch the lead up a little with a new brass bristle brush. Then cork up the breech, pour some mercury (quick silver) in the muzzle, cork the muzzle, and by moving the barrel, work the mercury back and forth over the spot for a few minutes. This will amalgamate the lead, and will usually remove it. Finally, instead of greasing the bore with gun grease, use mercurial ointment (blue ointment) rubbing thoroughly with this before placing the gun away, and leave the ointment in the bore for several days.

VIII
Removing Rust

Due to lack of care or accident a firearm may become rusted. When this has occurred the rust should be removed as soon as possible because it always gets worse, and pits the metal deeper and deeper. Rust seems to have a germ, and once it has started it progresses all the time unless this germ is killed. Often it does not seem to do much good to merely remove the rust because it soon starts up again. The germ should be killed and then the evidence of rust removed.

The best method of killing the germ is by heat, and the safest heat to apply is that obtained from boiling water as this is never hot enough to draw the temper from steel, or to change the qualities of the metal. Therefore the first treatment for a rusted part is either to boil it in water for a few minutes, or to pour boiling water over it until it becomes very hot. Then at once dry the part perfectly, and without delay proceed with the removal of the rust.

To remove the rust, saturate a piece of flannel with STAZON RUSTOFF, and rub the spot vigorously. If the rust is in the bore use Rustoff on a flannel patch with the cleaning rod. Occasionally renew the flannel and the coating of RUSTOFF. Continue until the rust is removed and the part has become polished and smooth. Of course if the rust has been present for some time the part will never become quite smooth again, as it will be pitted or eaten away under the rust. But a slight coating of rust can be very effectively and completely removed by this method, and the original polish of the part restored.

No fear need be felt about using STAZON RUSTOFF, as the abrasive contained in it is so mild that one would have to rub with it for many hours to produce any appreciable effect on steel. It is therefore a very safe method of removing rust. Owners of firearms should, however, be very cautious about using any other rust removers. Most of them are made for use on heavy machinery, although they may incidentally be advertised for use on guns. The abrasive is coarse and quick acting, and it would very quickly wear away the steel, and in a bore, for example, might render the weapon very inaccurate. STAZON RUSTOFF, on the other hand, is made primarily for use on fine firearms.

STAZON RUSTOFF may also be used on bright metal parts to preserve the polish, but it should not be used on plated parts, as for example nickel plate, to any great extent, as a number of vigorous applications might remove the plating. It will also remove the blueing from firearms, so that in certain locations it should be used with caution. Often on the exterior of a weapon it is better to merely kill the rust and not to try to remove too much of it, rather than make the arm unsightly by removing the blueing over a large surface.

IX

Storage of Firearms

A firearm which is left in a rack exposed to dust, dampness, or occasional handling, requires attention at intervals to preserve it in perfect condition. It should be cleaned, dried, and again oiled or greased at intervals of about a month in dry weather or two weeks in damp weather. If it be kept in a flannel or cloth case in a steam heated house it is reasonably safe for an indefinite period if properly cleaned and greased with STAZON GUN GREASE. But a gun will rust very quickly if left in a flannel or cloth case in damp weather, no matter how

it is treated before being placed therein, because the cloth gets very damp. In a waterproof canvas case, unlined, which has been treated with the paraffin process it will be safe for a longer period, but no gun is safe in a case except in a very dry place.

If the shooter desires to store a weapon under conditions where it cannot be given any attention at all for a long time, one particular method is strongly advised. The weapon should be most thoroughly cleaned. If it is a high power rifle it should be cleaned with the ammonia solution as described in Chapter VII. The weapon should then be most thoroughly dried, and to be certain that there is not the slightest trace of dampness on it anywhere the patches and wiping cloths used should be warmed over a stove. The bore should then be very heavily coated with STAZON, and this grease should also be painted all over the exterior and mechanism, using a paint brush. In handling the weapon, during painting, take particular care that the hands do not touch any of the metal parts and leave a film of moisture or perspiration thereon under the coating of grease. After this, handle the weapon only by the wood stock.

Make a wood box with a slot or cut in one end into which the butt-stock can be clamped, and with a block in the other end having a hole drilled therein to receive the muzzle. Paint these two supports with STAZON. Place the weapon in this box, supported at the butt and muzzle only by the wood. In this condition it will keep in perfect shape indefinitely provided that the box be placed in some location where water will not enter the box. Rifles treated and boxed in this manner have been kept in storehouses in the Philippine Islands, one of the dampest climates in the world, for twenty years without the slightest deterioration.

If it is desired to ship a weapon for a long distance it should be treated and boxed in a similar way, or, instead of having the supports at the butt and muzzle, it may be thoroughly wrapped in dry, heavy paper, which has been given a coat of STAZON, and then in excelsior, and then placed in the box. The box should be made practically rain proof. Never place cloth or felt linings to the box or the supports, as some people do, as these might absorb moisture in time and cause rust.

X

Cleaning Implements and Their Use

Proper cleaning and care of firearms can only be done with efficient implements. While there are many excellent implements on the market, there are also some very poor ones. For example, some cleaning rods will rub and eventually wear the bore, or they may break in use and be very difficult to remove from the barrel without ruining the bore. Certain scratch brushes may seriously abrade the steel surface of the bore. The best implements, used in the wrong way, may spell ruination of the weapon.

There follows a description of the various implements, accessories, and supplies that are needed for cleaning in accordance with the methods suggested in the preceding chapters, or that will be found convenient as labor saving devices. After the description the proper method of using the instrument is given. Almost all of these implements are readily obtainable on the market. The National Rifle Association of America, through its official organ "ARMS AND THE MAN," will be glad to give shooters the addresses of the makers of these instruments. Address The Editor, ARMS AND THE MAN, 1108 Woodward Building, Washington, D. C.

Rifle Cleaning Rod.—The old fashioned rod was made of hickory. Modern rods are usually made of brass. Neither are altogether satisfactory as they are liable to break, and in use the grit will stick to the softer material (the rod), and cut the harder material (the barrel). Moreover wood and steel are both attacked by ammonia. The best rifle cleaning rods are made of polished cold rolled steel rod. They should be long enough to clean from the breech of the rifle; that is they should extend from the muzzle to a point about eight inches in rear of the breech, or of the rear end of the receiver. Those intended for hard use on the rifle range or in the shop are usually solid one-piece rods. Those for the sportsman are made in sections which screw together, with joints about 9 inches apart so that they will pack conveniently in the kit. There are also pocket jointed rods with joints about six inches long, which will pack in a very small space, or can be fitted into a recess in the stock of the rifle under the trap in the butt plate.

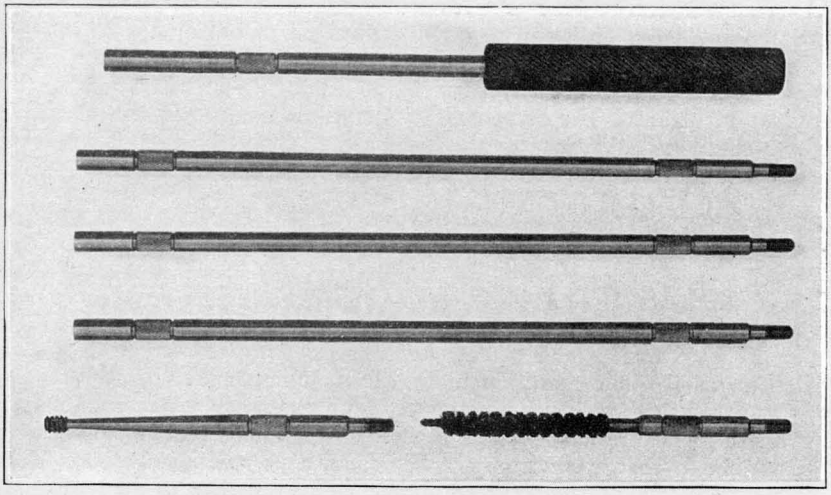

Figure 5. Jointed rifle cleaning rod, with tips for patches and brush

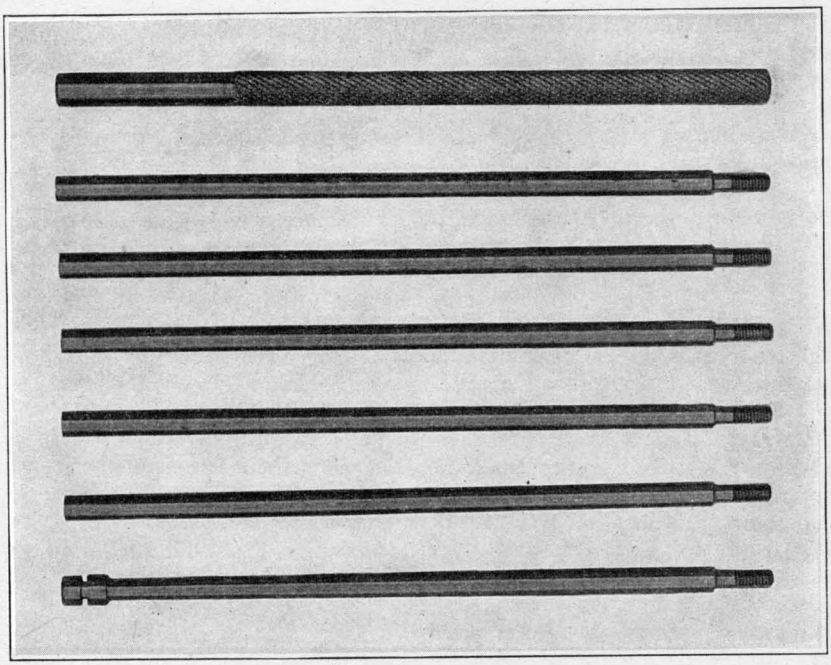

Figure 6. Pocket rifle cleaning rod

Jointed rods should always be of steel, as brass is not strong enough. The joints should be made with long dowel extensions to the screw so that when the rod is assembled it will be as stiff as a one-piece rod. The joints should be interchangeable so that any section can be screwed into any other section.

The handle for the rod should have a ball bearing joint so that the rod and the flannel patch will turn when being used, and the patch will follow the grooves and wipe out the corners clean instead of being pushed straight across the lands and missing the corners of the grooves. But a really efficient ball bearing handle is hard to get and very expensive. If it cannot be obtained it is better to get a rod with no handle at all, or with a very thin handle which will hardly be held so securely as to prevent its revolving with the rifling. Also if the rod has no handle there is less tendency to use a flannel patch so large or so thick that it might stick or wedge in the bore. Figures 5 and 6 show good types of jointed rods.

The tip of the rod which holds the patch is very important. It should be jagged as shown in Figure 7, so as to cause the patch to completely cover the tip, and prevent its touching the steel of the bore. It should never be slotted as a patch is liable to slide to one side on such a tip, allowing the opposite side to rub the bore. A slotted tip is also

Figure 7. Proper design of tips for rifle rod

more liable to jam its patch in the bore. The end of the jag should be drilled and tapped so that the standard brass wire bristle brush can be screwed into it, or else an extra section should be furnished tapped for this brush.

The following table shows the diameter of the steel which should be used in making rods for various calibers of rifles, the diameter of the jagged tip to correctly hold the patch, and the approximate size to which the square patch of medium weight canton flannel should be cut.

Dimensions of Cleaning Rods

Caliber	Diameter of body	Diameter of tip	Size of patch
.22	3/16″	.185″	1⅛″
.25	7/32	.197	1¼
.30	¼	.250	1⅞
.32	¼	.263	1⅞
.35	¼	.300	1⅞
.38	¼	.325	1⅞
.40	¼	.350	1⅞
.45	¼	.400	1⅞

Calibers larger than .30 are made from the same size rod as .30 caliber so as not to unduly increase the weight, but the diameter of the jagged tip should be in proportion to the caliber of the rifle.

To use the rifle cleaning rod.—Remove the breech bolt from the rifle if possible so as to clean from the breech. (If the bolt cannot be removed, see under Muzzle Guard, next page, for method of cleaning from the muzzle.) Place a clean piece of wood on the ground, or place a newspaper on the floor, and rest the muzzle on this, barrel vertical, breech up. (See Figure 1.) Or else place the rifle in a Rifle Cleaning Rack (see Figures 3 and 12). Take a flannel patch and center it over the opening of the chamber with the fingers. Take the rod and center the patch with the jagged tip, carefully pushing the patch through the chamber into the bore. Take care that the patch is well centered by the tip as it slides through the chamber so that it will be fully

covered on its sides by the patch. Now with a steady motion push the patch down through the bore until it reaches the muzzle, where it will be stopped by the board, the paper, or the side of the cleaning rack. Immediately pull it back to the chamber end of the bore. A little practice will teach one just when it enters the throat of the chamber. Don't let it come way back into the body of the chamber or the patch might come off the tip. Repeat this, thus thoroughly swabbing the bore from chamber to muzzle, the patch passing up and down about a dozen times. Finally, slightly raise the muzzle of the rifle and push the patch out at the muzzle and discard it.

The patch should push through the bore easily, with say about five pounds push and pull on the rod. If it is hard to pull it back better push it out the muzzle and discard it. After a bore has been cleaned with water, the second or third patch will go through tight with a lot of friction, and hence a smaller patch should be used at this time. Be sure not to use too large or thick a patch which would probably get stuck in the bore, and do not use old rags for patches which are easily punctured by the rod. A rod and patch stuck in the bore are very difficult to remove, and the bore is very liable to be ruined in the operation.

Wipe the rod clean and dry after using water, and wipe it with an oily rag when completing the cleaning.

Muzzle guards.—Many rifles, on account of their construction, cannot be cleaned from the breech. In cleaning from the muzzle it is very important that the muzzle be guarded from all wear as the accuracy of the rifle is to a large extent due to its perfect shape. The cleaning rod should not be permitted to rub the muzzle. It is quite difficult to prevent the rod rubbing against the muzzle while using it unless there be some kind of a guard over the muzzle. A muzzle guard is simply a cylinder of steel or brass, with a hole drilled through it. At one end the hole is of correct size to fit over the muzzle of the rifle, a fairly tight fit. The other end of the hole is large enough to admit the cleaning rod, but smaller than the bore of the rifle as shown in Figure 8.

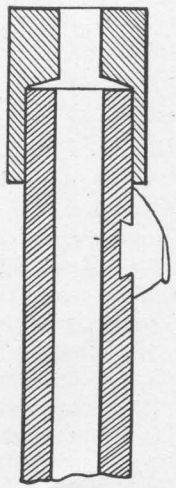

Figure 8. Design for muzzle guard

To clean from the muzzle, using the muzzle guard.—Take a fired cartridge case, plug up the muzzle of the case with a wood plug, cutting the plug off even with the muzzle. Put this case in the chamber of the rifle to prevent the patches running down into the chamber and coming off the rod during the cleaning. Stand the rifle up vertically, butt on the ground. (See Figure 2.) Center a flannel patch over the muzzle. Slip the muzzle guard over the cleaning rod, the end which fits over the muzzle being toward the tip of the rod. Center the flannel patch with the tip of the rod, and push the patch about an inch and a half into the muzzle. Slip the muzzle guard down over the muzzle and hold it there with the left hand. Now push the patch down to the plugged case

in the chamber, and pull it back to the muzzle guard. Continue this, swabbing the bore thoroughly from muzzle to chamber. Finally pull the patch up to the muzzle, take off the guard, and discard the patch. Remember that in cleaning this way the chamber receives no attention, and that it must be wiped out and oiled after completing the cleaning of the bore.

Flannel Patches.—It is important to use a good grade of canton flannel for cleaning patches. It should be of medium thickness. Do not use old rags, or cast off underwear. They puncture very easily, do not absorb moisture or oil well, and may be abrasive. Buy new canton flannel and then wet it with water and hang up to dry without wringing it out to increase its absorbing quality. Cut this into square patches of the right size to run easily through the bore on the tip of the cleaning rod. The size of the patch depends upon the size of the tip of the rod, and on the thickness of the cloth, and has to be determined by experiment. Convenient sizes are 1⅛ inches square for .22 caliber, 1¼ inches for .25 caliber, and 1⅞ inches for .30 caliber and larger. Keep these patches dry. Have a tight top can for them so they will not absorb moisture on damp days, or in the field keep them in a waterproof bag. See that they do not gather grit or dirt and carry it into the bore. In cleaning

Figure 9. Brass bristle brush for rifles and pistols

a rifle to put it away for a long time it is well to warm the patches that you use for the last drying before you use the STAZON, in order to be sure that they are perfectly dry.

Brass Wire Bristle Brushes.—Figure 9 shows the correct type of brass wire bristle brush for use in rifles. This type with brass bristles is better than types made with brass gauze, as the bristles get down into the corners of the grooves much better.

To use the brush it should be screwed to the tip of the cleaning rod. It is best not to completely screw it tight, but to turn it on for only a thread or so, so that it will surely revolve and follow the rifling. After use it should be washed off with water and allowed to dry. These brushes wear out rather quickly, one being good for only ten to twenty cleanings. Never use a steel wire brush as such brushes will wear, abrade, and scratch the surface of the bore, no matter how soft the steel of which they are made.

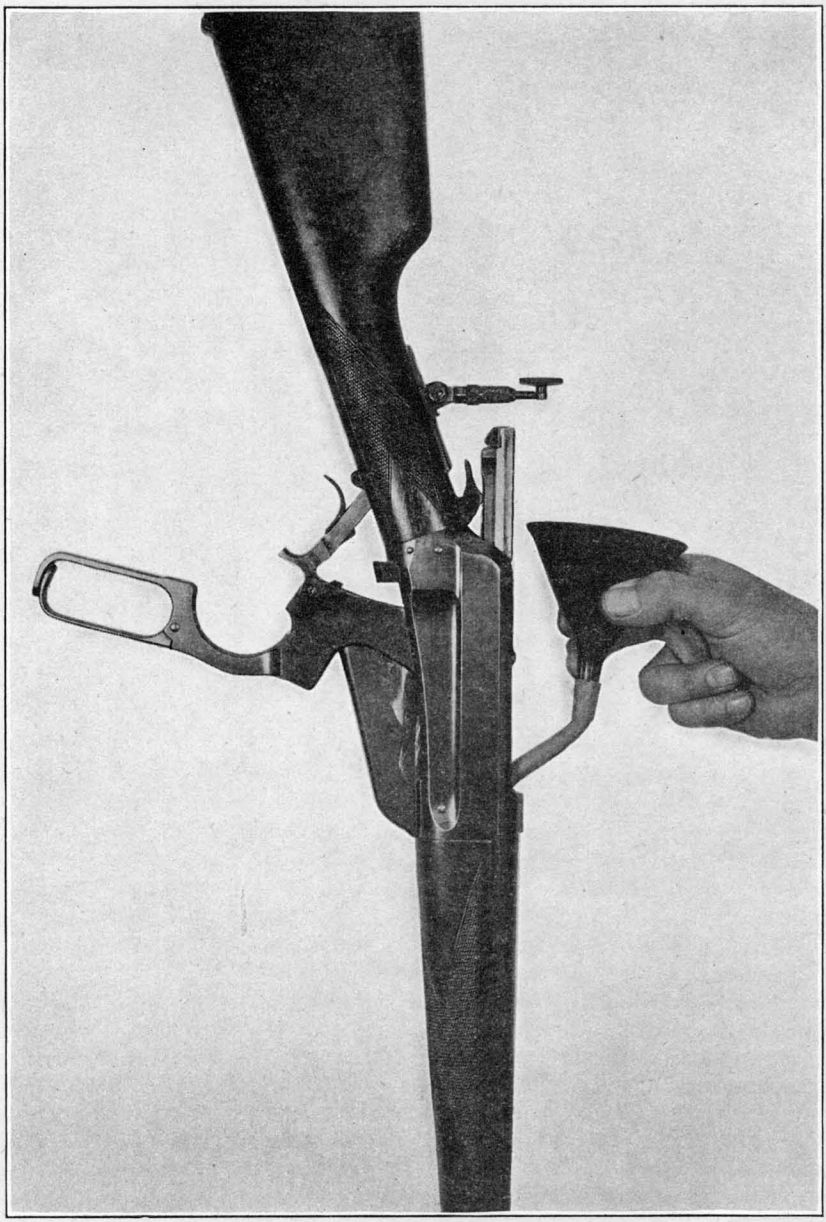

Figure 10. Funnel and tube for water cleaning

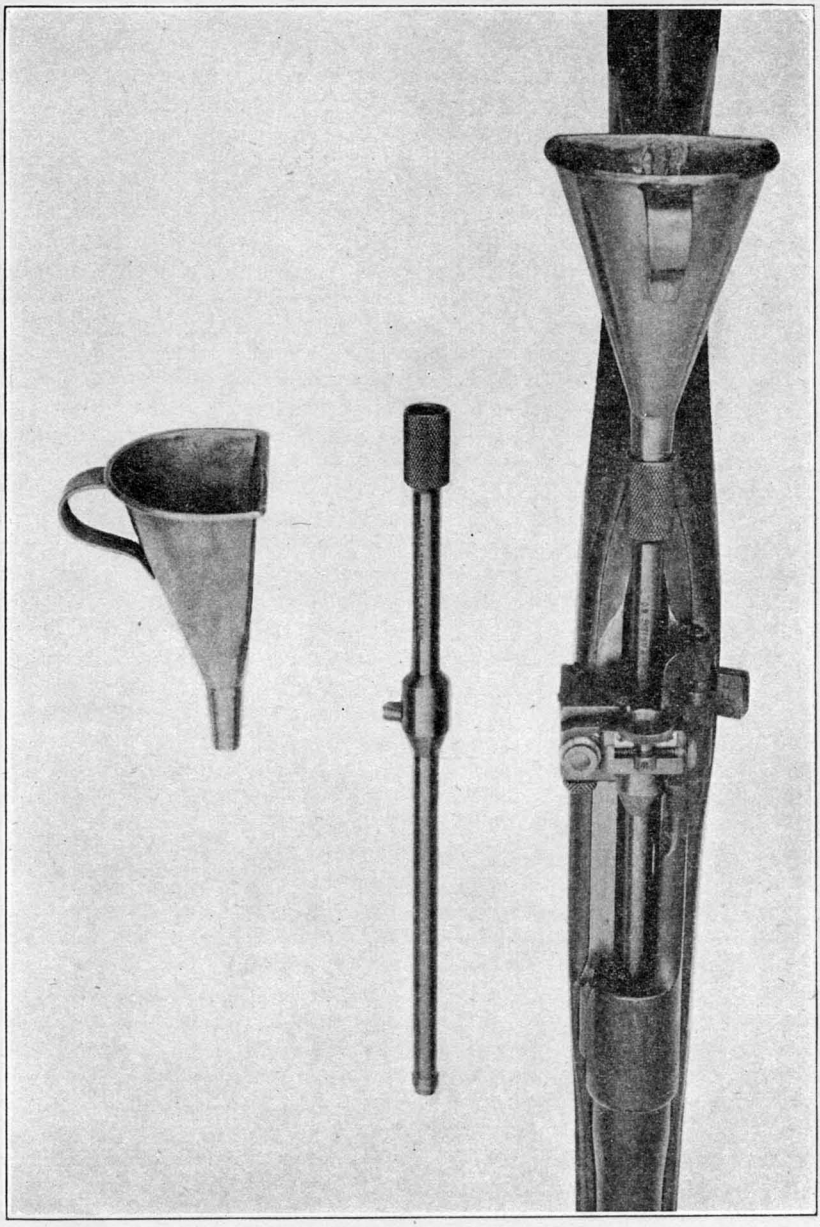

Figure 11. Special cleaning tube and funnel for cleaning bolt action rifles

Funnels and Cleaning Tubes.—When water is used to clean the rifle it is very desirable that the water be poured through the bore as this washes out the primer fouling much quicker than by swabbing with a patch wet with water. But there should be some device to keep the water off of the exterior and out of the mechanism of the rifle. Figure 10 shows a small funnel with a short section of rubber tube placed on the spout. The tube is inserted in the chamber of the rifle, the water poured in the funnel, and permitted to run out the muzzle.

Figure 11 shows a funnel and cleaning tube for similar use with bolt action rifles like the Springfield and Mauser. The tube is inserted into the receiver from the rear, the forward end of the tube extending down to the neck of the chamber where it makes a tight fit. The tube is then turned to the right and the lug on the tube wedges in front of the bridge of the receiver, thus locking the tube in the receiver. The funnel is then placed on the end of the tube, and water poured through the bore. The tube is very easy to handle, and keeps water out of the chamber and mechanism. After the water has been run through, the tube should be kept in the receiver, and makes cleaning the bore much easier. Remove the funnel, place a flannel patch over the rear end of the tube, and clean the bore through the tube. This avoids the rather difficult operation of correctly centering patches over the chamber opening in these rifles which have deep receiver wells in rear of the chamber, and it keeps the cleaning rod from rubbing and wearing the rifling just in front of the chamber. This combined funnel and cleaning tube is very convenient, and a great labor saving device when cleaning bolt action rifles.

Cleaning Racks.—Figure 12 shows a cleaning rack for use in cleaning the Springfield rifle or any other rifle that can be cleaned from the breech. One or more of these racks should be installed on every rifle range, and in every military company or rifle club. It greatly facilitates the cleaning when a number of rifles have to be cleaned at one time, and it holds the rifle in the easiest position for cleaning, and keeps it out of the dirt. Any carpenter can make one. The illustration shows its construction very clearly.

Three men can clean rifles on one side of the rack, and two on the opposite side. The small of the stocks at the grip rest in the square cuts A, B, C, and X, and Y. The muzzles are inserted in the holes a, b, c, x, and y, or a^1, b^1, c^1, x^1, or y^1. The distance between the two upper sides of the rack is such that the trigger guard of the rifle should bear snugly against the inside of the side board when the muzzle is inserted in the proper hole opposite the square cut in which the rifle is placed. The legs should be of such length that the top surface of the rack is 36 inches above the ground. Holes a, b, etc., are drilled through both side boards; holes a^1, b^1, etc., are drilled through the inside board only. The rifleman cleans his rifle with the muzzle in the holes a^1, b^1, etc., inserting the patch at the breech, pushing it down until it is stopped at the muzzle by the bottom of the hole, and then drawing the patch back to the chamber, in this way swabbing the patch back and forth through the full extent of the bore.

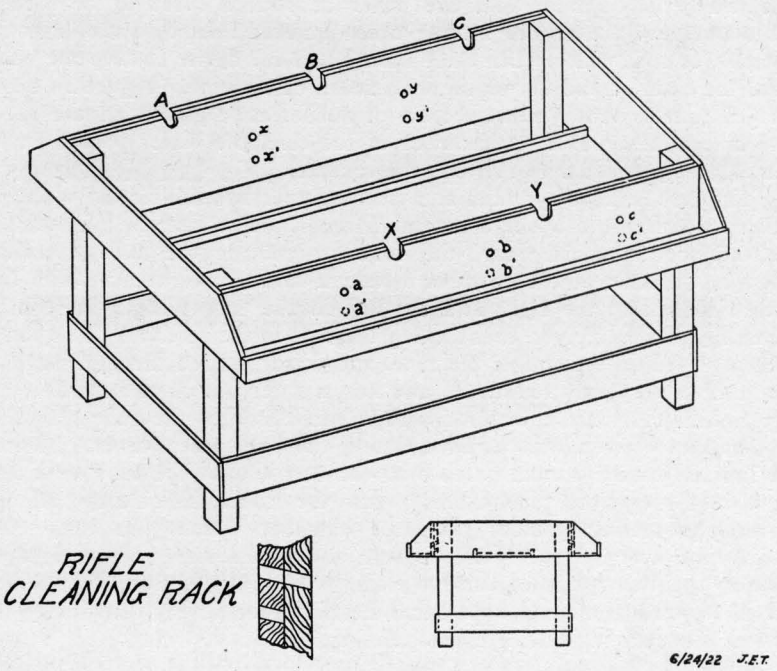

Figure 12

When he wishes to discard the dirty patch he shifts the muzzle of the rifle to holes a, b, etc., and pushes the patch out at the muzzle through this hole which extends through both boards as shown in the sketch. The trays outside the side boards, and inside the center are convenient for holding cleaning rods, grease, oils, and patches. The outside trays also catch the discarded patches and prevent their falling on the ground and blowing around.

Pistol Cleaning Rods.—These rods should in general be of the same type and construction as the rifle cleaning rod. The rod should be about six inches longer than the barrel of the pistol. It is not usually necessary to make it with joints, although this is not undesirable. One rod on the market has short joints and a large metal handle, the joints packing inside the handle when the rod is taken apart. With pistols and revolvers which have to be cleaned from the muzzle it is well to use a muzzle guard as described above. The tip of the rod should be threaded for a brass brush.

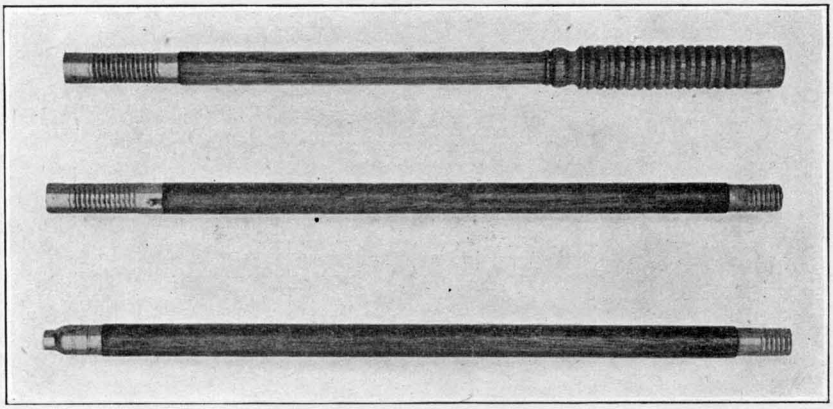

Figure 13. Shotgun cleaning rod

Shotgun Cleaning Rods.—The shotgun cleaning rod should be jointed. The best and most durable rods are made throughout of brass tubing, but wood rods with brass joints are very satisfactory. The handle of the rod need not be ball bearing. To use the shotgun rod, remove the barrels from the stock, and clean from the breech, resting the muzzle on a newspaper on the floor. Figure 13 shows a good type of shotgun cleaning rod, the tip being threaded so that any of the standard implements can be screwed into it.

Shotgun cleaning rods are usually provided with a slotted tip into which the flannel cleaning patch is intended to be threaded. This is usually not very convenient, and the patch does not fill the bore well. A jagged tip, like the tip of the rifle cleaning rod, is sometimes used to hold the flannel patch, but this is not very good either, because if the tip and the patch fit the bore as they should they will be too tight to enter the restricted portion at the muzzle where the choke is. Most commercial cleaning rods are accompanied with a little saucer-shaped steel wire brush as shown in Figure 14. This little brush is of no use as a brush, and being of steel, it is liable to scratch the bore. But it makes a most excellent implement for holding the flannel patch. Cut the patch about 2¼ inches square, of heavy canton flannel, and center it with this little steel brush. The patch keeps the bristles of the brush from scratching the bore, and the brush fills out the patch very well, pressing it tightly against the surface of the bore through the entire length of the barrel, including the choke portion. Wool swabs which screw on the cleaning rod are usually used to oil and grease the bore, but if saturated with grease they are nasty things to pack away, and are liable to gather grit and moisture. It is better to apply the grease or oil on the ordinary flannel patch each time, throwing the patch away when through with it.

Figure 14 Steel wire brush to be used with flannel patches on shotgun rod

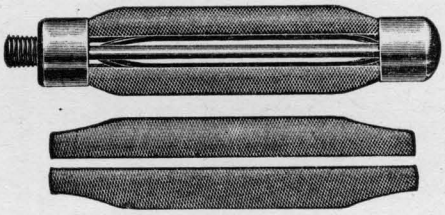

Figure 15-A

Figure 15-B

Good types of brass brushes for shotguns

Brass Brushes for Shotguns.—The brass brush is a very necessary implement for cleaning shotguns because so many of them take on a slight smear of lead from the charge of shot when they are fired. This lead can easily be scratched off with a brass bristle brush or brass gauze brush. The gauze brush usually lasts longer than the bristle brush. Figure 15 shows some good types of brass brushes for shotguns which screw on the tip of the standard rods. Do not use a steel bristle brush as it is liable to scratch the bore.

XI

Stazon Products

The CONVERSION PRODUCTS CORPORATION puts out four products indispensable to the users of firearms, the correct uses of which are described in this book. Others interested in preserving fine metals from the bad effects of rust will find in these products a convenient and sure method of overcoming their difficulties.

STAZON PRODUCTS are the result of many years experiment and use, having been developed by men who have spent years in the study of the care and preservation of firearms.

STAZON PRODUCTS for shooters have been officially adopted by the National Rifle Association of America, which organization is devoted to the best interests of the shooters of America, and which presents to those interested in firearms the best and latest information and advice on all subjects pertaining to the "Shooting Game." These products are used by many of the best shooters and teams of the country.

The four Stazon Products are:

STAZON
STAZON GUN OIL
STAZON POWDER SOLVENT
STAZON RUSTOFF

How Put Up

STAZON and STAZON RUSTOFF are put up in collapsible tubes of convenient size to carry in the field, or for handy use in the home or rifle club.

STAZON GUN OIL and STAZON POWDER SOLVENT are put up in oval shaped cans having a spout. The spout is so arranged that should it be desirable to use the can as an ordinary screw top can, the spout can be removed, accomplishing the desired result. The cans were designed as the most convenient for the sportsman for general use, and will fill all needs.

These four products are all that are needed for a sportsman's complete kit for the preservation of all fine weapons, tools, fishing gear, etc.

STAZON PRODUCTS IN DETAIL

STAZON

STAZON—a non-fluid grease—is an ideal protective. It can be easily applied and easily removed without the use of solvents. It is chemically inactive and contains no injurious ingredients of any description. It will not gum, thicken, harden, or crack in storage, nor under repeated changes of temperature of wide range; and protects by forming a coating impervious to air, moisture, and gases, and "STAYS ON."

STAZON will not melt and run off under any conditions of normal storage, thus leaving the metal surfaces exposed to the dampness, but will stand at well over 200° F. This means *positive* protection.

STAZON is also unexcelled as a lubricant for purposes for which a grease of its consistency is applicable.

A few of its uses are given below to indicate the wide range of its usefulness:

It will preserve weapons of all descriptions, in storage or in use. (A coating of STAZON on a shotgun in a duck blind will prevent its rusting while in use.) Golf clubs, tools, machinery parts, farming implements—when left in the weather—gears, shafting, gauges, cutlery, surgical instruments, hardware displays, scales, sheet and tube metal stock, marine equipment, sporting goods.

It will lubricate and preserve bearings, for which it is exceptionally good, as it will not break up into its constituent parts and run out of casings not absolutely tight. Automatic signal boxes on railroads, the heat of the sun melting normal greases and permitting the dampness from night dews and rains to rust the mechanism. STAZON withstands these conditions and affords *positive* protection and lubrication.

Lead terminals for storage batteries—the ability of STAZON to withstand heat prevents its running off when the terminal heats up, thus permitting the corrosive action of the acids.

Elevator guides and cables—the vertical position of which makes it difficult to keep lubricated, particularly in warm weather. It has been

found in actual practice that STAZON will decrease the lubricating needs of elevator guides and cables about fifty percent.

STAZON GUN OIL

STAZON GUN OIL is a thick viscous oil, having in proportion to its consistency all the preventative qualities of STAZON. It is also a perfect lubricant.

For putting weapons away for a short time, or to insure absolute preservation for guns in daily use, they should be coated with STAZON GUN OIL after cleaning. A rag or chamois skin saturated with STAZON GUN OIL, and carried in the field, if used to wipe the weapon off with occasionally, will insure protection in wet weather.

As a lubricant, STAZON GUN OIL is useful for the mechanism of firearms, hinges, locks, bolts, automobile springs, small motors, and all other uses where an oil of this consistency is desired.

The convenient form of the STAZON GUN OIL can makes it easily carried and applied in the home, shop, or gun club. The can is fine to carry in the field as it will not break as a bottle would. The keeping of a can in every home insures instant availability for any of the numerous needs for such an article.

STAZON POWDER SOLVENT

STAZON POWDER SOLVENT is a scientifically prepared solution, designed to neutralize the corrosive effects of modern powders and primers. It is a non-corrosive, non-abrasive solvent, which cleans solely by its chemical ability to offset the deleterious effects of the various residues left in the bore of modern firearms after firing.

Cases of metal fouling will frequently yield to cleaning with STAZON POWDER SOLVENT scrubbed vigorously into the bore with a brass wire brush, for several cleanings in succession. This loosens the metal fouling from the bore by attacking the powder fouling underneath. Guns properly cleaned with STAZON POWDER SOLVENT and a brush will rarely metal foul.

While many different methods of cleaning are advocated by shooters, and some of these are very efficient, notably the "Water Method," there are many times when the use of any but a conveniently packed Powder Solvent are impractical. Even in shooting clubs, members are prone to clean in the quickest way consistent with the good care of the weapon. For such instances STAZON POWDER SOLVENT is the best preparation—there is no possibility of rusting the weapon by failure to remove every trace of moisture as when water is used for cleaning; nor is there the necessity for carrying in the field the appliances necessary to make water cleaning easy and safe.

STAZON POWDER SOLVENT contains no acid.

STAZON RUSTOFF

STAZON RUSTOFF is designed to remove rust from metallic surfaces without injury to the surface. The need for such a substance is encountered daily, not only by sportsmen, but by everyone. How often is it necessary to remove rust from locks, hinges, stoves, cooking utensils, weapons, golf clubs, tools, and all other metal objects, subject to rust, and what a long, tedious job it is unless a good preparation like STAZON RUSTOFF is at hand!

Rusty articles, such as hinges, made bright with STAZON RUSTOFF, and kept bright and lubricated with STAZON, are kept indefinitely in as good condition as when new.

This product can also be used to polish metal surfaces.

IN CONCLUSION

As this book is designed only to be of aid to those desiring the best method of caring for firearms, the many other uses for STAZON will not be further touched upon.

If you have rust problems, write to the CONVERSION PRODUCTS CORPORATION, Stock Exchange Building, Philadelphia, Pa., and let their Engineers solve them for you.

The Holmes Press
Philadelphia